

Appl. S.N. 09/681,949
Amtd. Dated February 5, 2004
Reply to Office Action of Nov. 5, 2003

RD-29,070

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A computer implemented method for enabling at least one of field service of machines and training of field service personnel comprising:

generating at least one validated sequence of actions for at least one maintenance task;

validating said at least one sequence in a virtual environment to ensure said sequence can be performed by field service personnel;

converting said at least one validated sequence into instructions for said at least one maintenance task; and,

delivering instructions for said at least one validated sequence for use in performing said at least one maintenance task.

2. (previously amended) The method of claim 1 wherein said instructions comprise natural language instructions

3. (original) The method of claim 2 wherein said natural language instructions comprises at least one of written instructions, voice instructions and animated exploded view video instructions.

4. (original) The method of claim 1 wherein the generating step imports engineering data comprising a Computer Aided Design (CAD) model.

5. (original) The method of claim 1 wherein the generating step comprises:

importing said engineering data;

determining mating interfaces of a plurality of component parts within a given assembly;

creating at least one component part removal path for at least one of said component parts; and,

generating said at least one sequence of instructions responsive to said creating step.

6. (original) The method of claim 5 further comprising repeating said generating step to generate a plurality of sequences.

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7. (original) The method of claim 1 wherein said validating step is performed with a haptic interface.

8. (currently amended) A computer implemented method for enabling at least one of field service of machines and training of field service personnel comprising:

generating at least one sequence of actions for at least one maintenance task;

validating said at least one sequence in a virtual environment to ensure said sequence can be performed by said field service personnel;

converting said at least one validated sequence into instructions for said at least one maintenance task; and,

delivering instructions for said at least one sequence for use in performing said at least one maintenance task.

9. (previously amended) The method of claim 8 wherein the validating step provides feedback to the generating step, said feedback relating to human factors needed to perform said at least one maintenance task and said human factors including at least one of reach and grasp of parts, ability to perform certain motions, and factors relating to weight, length and visibility of components.

10. (original) The method of claim 8 wherein the delivering step comprises providing written instructions.

11. (original) The method of claim 8 wherein the delivering step comprises providing alternate instruction presentation such as voice instructions.

12. (original) The method of claim 8 wherein the delivery step comprises providing animated exploded view video instructions.

13. (original) The method of claim 8 wherein the generating step imports engineering data comprising a Computer Aided Design (CAD) model

14. (original) The method of claim 8 wherein said validating step is performed in a virtual environment.

15. (original) The method of claim 8 wherein said validating step is performed with a haptics interface.

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16. (original) The method of claim 8 wherein the generating step comprises:

importing engineering data from a Computer Aided Design (CAD) model;

determining mating interfaces of a plurality of component parts within said CAD model;

creating at least one component part removal path for at least one of said component parts in a given exploded view; and,

generating said at least one sequence of instructions responsive to said creating step.

17. (original) The method of claim 16 further comprising repeating said generating step to generate a plurality of sequences.

18. (previously amended) A system for enabling at least one of field service of machines and training of field service personnel comprising:

an engineering data generating device for computing and providing engineering data relating to said machines;

a service sequence generator for importing and processing said engineering data to generate at least one sequence of instructions for at least one maintenance task;

an automated generating device for converting said at least one sequence of instructions into natural language instructions for use in said at least one maintenance task;

a validating device for verifying said at least one sequence and natural language instructions in a virtual environment to ensure said sequence could be performed by said field service personnel; and,

a delivery device for delivering said natural language instructions to said field service personnel.

19. (original) The system of claim 18 wherein said engineering data generating device is a Computer Aided Design (CAD) system and said engineering data comprises at least one of CAD models and engineering drawings.

20. (original) The system of claim 18 wherein said automated generating device produces human-readable instructions for said maintenance tasks

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21. (original) The system of claim 18 wherein said human-readable instructions comprise at least one of written instructions, voice instructions and animated exploded view video instructions.
22. (original) The system of claim 18 wherein said validating device comprises a haptics device.
23. (previously amended) The system of claim 18 wherein said service sequence generator is further for generating a plurality of collision-free part removal paths for said at least one sequence of instructions.
24. (previously amended) The system of claim 18 wherein said delivery device is further for permitting said service personnel to select a desired format for said instructions.
25. (original) The system of claim 24 wherein said format comprise at least one of written instructions, voice instructions and animated exploded view video instructions.